



Missouri
Department of
Natural Resources

Tanks RBCA Meeting Minutes

Meeting held February 26, 2007

Roaring River Conference Room

1:00 – 4:30 pm

Introduction (Bob Geller)

Introduced self, thanked people for coming

Why here? Go over process, history, overview, plan for document changes – want input from those affected.

Guidance issued 3 years ago, DNR promised to revisit and make necessary changes

Who involve? Anyone with input.

Outcome? New & improved document for use.

Done? Hopefully 1 year or less.

In general guidance is good, some areas need improved and clarified. Streamline process. Issue NOFAs for sites.

RBCA process differed from old methods of cleanup. Takes more time, but cleanup is improved.

Alice Geller

Our goal is to complete document revision by March 2008

- 3 more work meetings

- redraft by August 2007

- complete reviews and rewrites by end of 2007

- finalize around March 2008

- will have at least 2 stakeholder reviews in the process

During today's meeting we'll discuss:

- History of RBCA in Missouri – Tanks and The Rest of It

- Basics 101 for Tanks RBCA

- 6 topics for updates, and any other that people suggest

- Next steps, next meetings

Ken Koon

RBCA introduced in February 2004 as a result of process that started way back.

Was considered “corrective action” then.

Workgroups put together document with help of public, private and governmental representatives.

Evaluation of pathways allows some contamination to remain in place with RBCA. No longer have to dig to certain levels.

Three years under new doc – 358 NOFAs have been issued. Closure NOFAs issued vs. open remediation cleans.

Over time issues have surfaced due to advances in science, policy, procedure, etc. Revision started in 2005. Process was halted because of budget cuts. However, before the process was halted, revisions were sent to around 200 stakeholders – received about 10 responses.

DNR committed to a one year timeframe for document – move to rulemaking. #1 issue is cleanup numbers. Cleanup to certain levels regardless of site use.

History of MRBCA (Rich Nussbaum)

Senate Bill 334 asked the department to look at risks, early on saw comments.

Worked on rules, did not satisfy all. Comprehensive guidance was needed, MRBCA was created. Policy issues prevented early progress. Subgroups were formed to discuss/study policy choices that were complicated. Came together and put together initial choices.

Commitment by DNR to both RBCA documents. Long-term effort to keep document useful for everyone.

(Q) Are policy choices being revisited or are we going to plow new ground? (Carol)

(A) Not revisiting. Evolution of document and refining areas that need it.

Alice Geller

Sometimes there is confusion between laws, rules and guidance.

Law gives the department the authority to do what we do and is enacted by the General Assembly or Congress. A rule is more specific than a law. It goes through a formal process with the Secretary of State and is approved. Guidance is a document for the department's use; it helps us and the public.

A question was asked whether some of the requirements would go into rule, and with the left rest as guidance. Yes, parts of both RBCA documents will be developed as rule. However, we will only be going over Tanks RBCA guidance in these meetings.

(Comment) Comment was made to go back and codify skeletal requirements in rule form. Can we separate requirements as rule and leave the rest of the information as guidance? (Carol)

(Answer) Yes, parts of both documents will be developed as rule. However, we will only be going over the guidance today. (Alice)

Two ground rules for meeting to allow us to progress:

1. Respect others and respect time.
2. Participate.

As a facilitator I help prepare for the meeting and keep the meeting moving ahead.

Tanks RBCA 101 (Tim Chibnall)

- Based on American Society for Testing and Materials (ASTM) standard E1739-95
- Focus on actual and potential risks
- Addresses site investigation and risk assessment, determines need for risk management
- Site investigation necessarily more in-depth and detailed given goal of determining how much contamination can be safely left
- From inception, process intended to require more in-depth and detailed site investigation, more work up front in order to minimize back end remediation
 - However, Tanks experience is that this has not happened to a significant degree; site investigation remains similar to pre-RBCA investigations
 - One of the issues to be addressed by this revision
- Guidance calls for relatively dense sampling to ensure full and detailed delineation of vertical and horizontal extents of contamination
- RBCA requires development of exposure model identifying current and future receptors, pathways, and routes of exposure
- Future conditions tend to drive the process
 - Inability to readily predict future conditions requires conservatism
 - Reluctance on the part of RPs to use or accept AULs
 - Thus little assurance that conditions will not change in the future
 - RBCA models do not account for temporal changes in physical conditions such as rising and falling water tables, changes in soil moisture, etc.; therefore, conservatism is called for
- Receptor and pathway analysis can seem intuitive
 - However, many assumptions are made when evaluating future conditions
 - These assumptions must either be preserved via AUL application or minimized
 - Given RP reluctance to apply AULs, we instead minimize assumptions as much as possible – resulting in a conservative approach
- Only AFTER site characterization is complete can a definitively accurate exposure model be developed and risk assessment conducted
- Conducting risk assessment before site characterization is putting the cart before the horse
- Risk Assessment
 - Based on exposure model and site characterization
 - Whether, how, and to what extent exposures can occur
- Indicates acceptable or unacceptable risk

Tier 1 Risk Assessment

- Uses target levels based on conservative exposure/fate & transport values
- 3 sets based on 3 soil types (sandy, silty, clayey)

Tier 2 Risk Assessment

- Uses same models as at Tier 1 but site-specific fate and transport values
- Requires more intensive site characterization to collect site-specific fate and transport data
- Some factors more sensitive than others

- Most sensitive is volumetric water content and fractional organic carbon
- Risk assessment process and methods the same at T1 and T2, only the target levels change
- Tanks has found that volumetric water content in particular, and foc to a lesser extent, are too sensitive in the models used
 - Spatial and temporal changes in VWC expected
 - Current provisions do not account for such changes and, therefore, VWC values are not reliable
 - This can result in unacceptable risks in the future
- Tanks has found that most sites that do not close at Tier 1 close at Tier 2
- Very little actual remediation is occurring

Tier 3 Risk Assessment

- Depart from the guidance models in whole or in part
- Requires approval from DNR
- Haven't seen any Tier 3 evaluations to date

- Cleanup to DTLs
- The tiered process and risk assessment can be avoided entirely by cleaning up to DTLs and using maximum concentration values for comparison
 - We don't see DTL cleanups
 - Some sites do not initially exceed DTLs so RA not needed
 - Cleanup to DTLs is the best way to limit long term liability
- Risk Management under RBCA
- Required when risks unacceptable, i.e., representative concentrations exceed target levels
- Methods are not prescribed: physical, chemical, biological remediation, AULs
- As above, AULs are nearly never used, maybe 6 or 7 times thus far
- Most sites gain closure without any sort of risk assessment
- No Further Remediation Action status
 - NFA granted if:
 - Representative concentrations of COCs < RBTLs/SSTLs
 - Plume is stable or decreasing
 - Assurance that land use/exposure model assumptions used in risk assessment not violated in the future
 - May require an AUL
 - No ecological concerns exist
- Key Observations
 - Need more in-depth, detailed site characterization
 - Most sites are closing without risk assessment
 - AULs are not being used – very little certainty that assumptions regarding future use and conditions will remain unchanged, therefore uncertainty regarding accuracy of risk assessment and adequacy of risk management actions

- Greater use of AULs and other LTS mechanisms needed given that most contamination is staying the ground
- Models at Tier 1 and 2 might be too simple resulting in target levels governed by one or two parameters
- Extraordinarily high SSTLs are suspect
- Plume stability must be further addressed and acceptable methodology developed
- Must continue to work toward minimization of assumptions, particularly in the exposure model and off-site receptors
- Guidance provisions today are not sufficiently detailed allowing for too much subjective interpretation – resulting in inconsistencies now addressed through internal policy development
- Demonstrated need to more clearly explain and elaborate on certain provisions
- DNR has learned a great deal about what the guidance does well and not so well
- Have developed numerous policies to assure adequate protection and consistent application by project managers to all sites
- These policies will be reflected in large part in the revised guidance

Alice Geller

Six identified topics that need to be either updated or added to the Tanks RBCA guidance. We'll go over each of those first, and then gather topics from the workgroup. Those topics are:

- (1) Water line protection
- (2) Plume Stability
- (3) Tier II Parameters (organic carbon & volumetric water)
- (4) Public Participation
- (5) Off-Site Contamination
- (6) Long Term Stewardship (LTS)

#1 - #3 will be handled in subgroups

#4 - #6 as a large group. DNR will put something together and present these for comment.

(1) Water Line Protection (Tim Chibnall)

The petroleum RBCA guidance does not include provisions for the evaluation of water lines in contact with or proximate to petroleum contamination. Experience tells us that such provisions are needed. Many other states have developed guidance regarding water line protection.

Any protocol in this regard must account for past, current, and future circumstances. Unlike other pathways, past circumstances can have considerable bearing on whether water lines are now compromised or could be in the future. While the issue pertains primarily to plastic water lines, any protocol must consider all materials that are or could be used. The protocol must also consider both chemical and physical forces that could result in unacceptable risk. In addition, all media – soil, groundwater, and vapor – must

be considered when developing a protocol to assess risk associated with water lines in or near contamination.

DNR staff are in the process of gathering existing information pertaining to the subject. That information will serve as a starting point. DNR will convene a subgroup to study the issues and create a draft protocol. We intend that the subgroup be directed by DNR policy.

(Q) Sites involving water lines? Resolved? How?

(A) No, where lines are primary issue sites are still evolving.

(2) Plume Stability (Tim Chibnall)

A RBCA evaluation largely represents a snapshot in time, even when data is collected over months or years. But the process is intended to represent both current and future risks. One way this is done is through demonstrating that a plume is stable both in concentration and physical extent. This demonstration is necessary in order to ensure that conditions represented by the risk assessment are not going to appreciably change over time such that the conclusions of the risk assessment are no longer accurate. Were conditions to change, risks could increase to unacceptable levels. At present, due to shortcomings in the LTS provisions of the guidance, DNR and possibly no one would be aware of that increased risk. A demonstration of plume stability gives DNR confidence that conditions are not going to get worse and, therefore, that issuance of a NFA is appropriate.

While plume stability evaluations are and will remain critical to the RBCA process, DNR has found that plume stability evaluations are, at times, a hindrance to quick closure of sites. In some cases, this is just an unfortunate reality about which little or nothing can be done. But for others, we are finding that the problem is both the time involved and, more importantly, the lack of clear guidance regarding acceptable plume stability determination tools. The latter we can do something about.

Inherently, a plume stability determination requires data collected over time. There is no legitimate way around this fact. But we can clarify how such determinations are made and establish minimum data needs through the development and application of one or more reliable, accurate and defensible models.

The current guidance provides very little detail with regard to how a plume stability determination is to be made, saying only that, by default, two years of data are needed for the determination process. Because of the lack of detailed guidance, at this time plume stability determinations are frequently largely subjective. This subjectivity can undermine the intended scientific basis of the RBCA process. It certainly leads to disagreements about whether a plume is stable. The development and application of accurate and reliable plume stability evaluation tools is intended to eliminate, as much as possible, this subjective aspect. Doing so will hasten the decision making process both with regard to stability and site closure.

DNR will convene a subgroup to evaluate this issue and either develop new or adopt existing statistical methods for evaluating plume stability. The agreed to methods will then be incorporated into the RBCA guidance.

(Q) Will there be a subgroup on this?

(A) Yes, there will be subgroups for issues #1 - #3.

(Comment by Ken Koon)

The PSTIF Board is providing \$ to have experts look at the plume stability models.

Tier II Parameters – Fractional Organic Carbon and Volumetric Water Content **(Tim Chibnall)**

At Tier 2 of the RBCA process, evaluators collect site-specific geotechnical data and plug that data into the Tier 1 RBCA models in order to generate site-specific target levels. While numerous variables can be made site-specific at Tier 2, only a few have a significant effect on target levels. Of those, two have the most significant effect on target levels: fractional organic carbon (FOC) and volumetric water content (VWC).

In implementing the guidance, DNR staff have found that relatively minor changes in FOC and, more so, VWC result in significant, generally upward, changes in vapor intrusion target levels. For instance, all other parameter values staying the same, a change in VWC from 8% to 16% results in a threefold increase in the target level. A change in VWC from 8% to 32% (and we see VWC values this high and higher) results in a 240-fold increase in the target levels. This illustrates the sensitivity of this parameter.

Fractional organic carbon is also a sensitive parameter, though less so than VWC. All other parameters kept the same, a change in FOC from 0.6% to 1.2% results in a 20 to 50% increase in target levels.

The problematic issue regarding both VWC and FOC is that developing an accurate value for either is very difficult through traditional field sampling protocols. This is true for FOC because the percentage of FOC present at a site varies throughout the soil column (horizontal and vertical). In addition, the presence of organic contaminants, including petroleum, can cause artificial increases in the amount of FOC present in a sample.

Developing a representative value for VWC (the most sensitive parameter in consideration of the vapor intrusion pathway) is more difficult than for FOC because, in addition to significant spatial variations, temporal variations in VWC can be even more pronounced. Therefore, in order to assure accurate data for VWC, samples would not only have to be collected from various points in space but also in time.

Considering the sensitivity of VWC in the RBCA model and the knowledge that VWC changes over time and space, we can be confident that the target levels calculated by the

RBCA model for vapor intrusion are very likely inconsistently protective at best. The model fails to account for the significant variability of the parameter. Therefore, DNR believes a review of the guidance provisions related to sampling for VWC and how and whether VWC may be modified at Tier 2 is warranted.

DNR will convene a subgroup to explore this issue and develop recommendations for inclusion in the guidance.

(Q) Have you seen any COC's affected by moisture? (Carol)

(A) Benzene, yes....(Tim)

(Q) Asked the question wrong. Any COC that is the driver for the cleanup? (Carol)

(A) Yes – benzene is primary COC we deal with. (Tim)

Public Participation (Ken Koon)

The RBCA guidance does not include provisions regarding public participation. However, public participation is required by 10 CSR 20-10.067. To ensure compliance with this regulation, DNR intends to revise the guidance to include specific public participation provisions. Our current policy regarding off-site contamination and future use of off-site properties comes closing to fulfilling one the obligations imposed by the regulation, that being notification of “those members of the public directly affected by the release.” However, this is only the case if the responsible party intends to consider future use of an off-site property as non-residential. In that case, the responsible party must obtain the written consent of the off-site owner as to the future non-residential use of the property. Because the policy addresses the situation only some of the time, DNR will add provisions to the guidance to ensure that public participation obligations are met for every site.

Important to note is the fact that the regulation places the public participation burden on DNR, not the responsible party, with the statement “. . . the department must provide notice to the public . . .” For this reason, DNR sees revision of the guidance with respect to this issue as its responsibility. Therefore, we do not intend to convene a subgroup to address the issue. We will, however, entertain comments regarding the provisions we add to the guidance.

Comment: EPA pushing to accelerate cleanup. Will need to consider timeframes. Encourage people to remember the old adage “if it ain't broke, don't fit it”. Not many cleanups need public participation.

(Q) What tanks cause the most problems?

(A) Tanks/piping good for almost all tanks in Missouri. Historical contamination is what most the problem is.

Comment: Off-site property notification should be more friendly. Access has been a problem for consultants in the past.

Off-Site Contamination (Chris Cady)

Off-site contamination is a component of several aspects of the guidance, including delineation criteria, the exposure model representative of future conditions (i.e., reasonably anticipated future use or RAFU determinations), and public participation. The current DNR policy addresses, at least in part, all three aspects. That policy states the following: “For the purposes of site investigation and risk assessment, the land use of all properties adjacent to and near a property where a petroleum release has occurred (such properties generally referred to as “off-site properties”) are to be considered residential unless and until the owner of each off-site property agrees, in writing, that future use of the property will be non-residential.”

With respect to delineation criteria, as per the current guidance, delineation criteria for all sites are the Soil Type 1 Residential Risk-Based Target Levels (RBTLS) unless the contamination is and will remain confined to non-residential property. In accordance with the above policy, if contamination migrates off-site, the responsible party must either delineate to residential Soil Type 1 RBTLS or obtain a statement from the owner of each affected off-site property indicating that future use of the off-site property will be non-residential.

With respect to the exposure model, the existing guidance is not entirely clear regarding how to predict the future use of off-site properties. Therefore, DNR has supplemented the guidance with the policy stated above. Accordingly, for the purpose of the exposure model, off-site properties are to be considered residential in the future unless and until the owner of each affected or potentially affected off-site property agrees, in writing, that use of the property will be non-residential in the future.

With respect to public participation, which is a requirement of 10 CSR 20-10.067 but is not addressed at all in the guidance, the above stated policy at least requires that parties affected by a release are informed of that release, if only indirectly through solicitation of a statement regarding future use of their property. Clearly, the guidance should be revised to include provisions for ensuring adequate public participation with respect to releases that effect or could effect a community rather than simply a single property.

The department intends to incorporate the above stated policy into the RBCA guidance. Further related provisions will be added where appropriate to clearly address off-site contamination issues. Because the off-site issues have a distinct regulatory connection and DNR is responsible for ensuring compliance with regulatory provisions, DNR sees revision of the guidance with respect to these issues as its responsibility. Therefore, convening a subgroup is not warranted. We will, however, consider comments regarding our revisions to the guidance applicable to these issues.

DNR will develop provision and submit for public comment.

Long Term Stewardship (John Madras)

A comprehensive, durable, and effective Long Term Stewardship system is a critical component of any risk-based process. Activity and use limitations are an essential component of an LTS system. An LTS system is needed whenever contamination greater

than unrestricted use levels remain in place. This is needed to carry out the department's responsibilities for protecting human health and the environment. If the department is signing off on a cleanup that includes limitations on site use, we need to make sure such restrictions stick.

The system needs to include tracking and monitoring mechanisms, notification provisions to the extent needed, and a publicly accessible face to serve real estate and other property interests.

The department is placing increased emphasis on LTS since it is clear many sites will be in the system and needing a comprehensive system to unify all the various aspects of managing contamination left in place.

The department is developing an effective LTS system and tank sites will be one subset of sites within a system. The petroleum guidance will be revised to provide a draft of meaningful and effective LTS tools, and stakeholders will have the opportunity to review and comment on it.

Consistent RBTLs Departmental and Petroleum RBCA Guidance (Tim Chibnall)

To ensure consistency between the two guidance documents, RBTLs for petroleum COCs will move from those currently in the petroleum guidance to those in the departmental guidance. The RBTLs in the departmental guidance use the most recent toxicology data and include RAGS Subpart E dermal contact provisions. The RBTLs will change to be consistent, resulting in one set of RBTLs for all sites.

Other Topics? (Alice Geller)

Are there topics that haven't been mentioned that you'd like to discuss during this guidance update?

- (1) Oil range organics (EPA Method 8270)
- (2) Free Product
- (3) Analytical Parameters
- (4) Summary of Tanks RBCA changes

We suggest that subgroups be formed to discuss and draft strawman language on: water line protection, plume stability and Tier II parameters. Staff will draft changes for: public participation, off-site contamination and Long Term Stewardship (LTS), oil standards, free product and analytical parameters. Each of these documents will then be brought to the entire workgroup for discussion.

At the next meeting, possibly in April, the public participation, off-site contamination and Long Term Stewardship strawmen will be ready. We'll discuss the other topics at future meetings, so the subgroups have time to meet.

Members for the subgroups were gathered. If anyone else wishes to be on a subgroup, please contact Ken Koon.

The program will establish a website for the Tanks RBCA Workgroup. All meetings materials, agenda, notes, etc will be posted on the website. The website will be under the Hazardous Waste Program's header. An email will be sent to workgroup members when anything is posted.

Tim Chibnall hopes to have the entire Tanks RBCA guidance updated by August 2007. As chapters are done, they will be posted on the website so the workgroup does not have to review the entire document at once.

The workgroup will have an opportunity to comment on the first redraft of the guidance. Staff will then consider the comments, and make a second redraft. Workgroup members will have time to comment on the second version. Staff will then consider those comments and finalize the guidance. We hope to have all this completed by March 2008.

(Ken Koon)

Just a reminder that RBCA has not stopped source removal.

Revision process will lead into rulemaking.

Get your e-mail addresses to us. Check on our RBCA stakeholder web page for progress.

(Bob Geller)

Will notify folks of next meeting date; can move ahead of schedule if able.

Encourage folks to attend the meetings, participate in subgroups.